Patent Claims

1. Rotary friction welding process for joining or connecting components, wherein a first component (11) is moved rotationally, wherein a second component (12) is stationary, wherein the rotating component (11) and the stationary component (12) are pressed against one another with a specific force, and wherein joining surfaces of the components (11, 12) being connected are hereby adapted to one another, and a connection bead (20) is formed in the area of the joining surfaces, characterized in that
a relative position and a compression between the components (11, 12) being connected to one another are measured, and that then, when a pre-specified compression and a pre-specified relative position are reached, the stationary component (12) is released in such a way that it rotates jointly with the rotating component (11).

2. Rotary friction welding process according to Claim 1,
characterized in that
two rotationally symmetrical components (11, 12) are connected to one another in such a way that, on the one hand, the longitudinal axes of the two components (11, 12) are stacked or coincide, and that, on the other hand, in the circumferential direction a pre-specified relative position, particularly a pre-specified angularity, is maintained between the two components (11, 12).

3. Rotary friction welding process according to Claim 2,
characterized in that
the two components (11, 12) being connected to one another are embodied as integrally bladed rotor disks, wherein the relative position, particularly the angularity, in the circumferential direction between the two rotor disks is determined by the desired relative blade position of the two rotor disks.

4. Rotary friction welding process according to one or more of Claims 1 through 3,
characterized in that
when both components (11, 12) are connected to one another and rotating jointly, an additional compression occurs.

5. Rotary friction welding process according to Claim 4,
characterized in that

to do so, the two components (11, 12) that are connected to one another and rotating jointly are pressed against one another with a specific force.

6. Rotary friction welding process according to one or more of Claims 1 through 5, characterized in that
the pre-specified relative position, at which the stationary component (12) is released when the pre-specified compression is reached, is determined at least as a function of the two masses of the components (11, 12) being connected to one another and as a function of the rotational speed of the rotating component (11) directly before the release of the stationary component (12).

7. Rotary friction welding process according to one or more of Claims 1 through 6, characterized in that
the relative position and the compression between the components (11, 12) being connected to one another is measured online during the friction welding.

8. Rotary friction welding machine for joining two components, with a first spindle (14) and a second spindle (15), wherein a first component (11) of the components (11, 12) being connected to one another is positioned on the first spindle (14) and a second component (12) of the components (11, 12) being connected to one another is positioned on the second spindle (15), and with a device in order to press the rotating component (11) and the stationary component (12) against one another or on one another with a specific force for the rotary friction welding, characterized in that
the second spindle (15) is blocked by a holding device, and that the holding device then, when a pre-specified compression and a pre-specified relative position of the components (11, 12) being connected to one another are reached, can be loosened in such a way that the stationary component (12) rotates jointly with the rotating component (11).

9. Rotary friction welding machine according to Claim 8, characterized in that
the two spindles (14, 15) are positioned on a low-friction axial bearing.

10. Rotary friction welding machine according to Claim 8 or 9,
characterized in that
the blocking and the loosening of the second spindle (15) is accomplished via a magnetic holding device, for which the polarity can be reversed to loosen the second spindle (15) and which serves as a magnetic bearing after the polarity is reversed.

11. Rotary friction welding machine according to one or more of Claims 8 through 10,
characterized by
at least one measuring device for monitoring the compression between the components (11, 12) being connected to one another.

12. Rotary friction welding machine according to one or more of Claims 8 through 10,
characterized by
at least one measuring device for monitoring the relative position in the circumferential direction between the components (11, 12) being connected to one another.